

PATENT ABSTRACTS OF JAPAN

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(54) INK JET RECORDING SHEET AND ITS PRODUCTION

(57)Abstract:

PURPOSE: To obtain an ink jet recording sheet free from a color bleeding even if it is wet by water after printing and obtain a production method thereof.

CONSTITUTION: In an ink jet recording sheet provided with an ink-absorbing layer made of a binder and a filler on a substrate, a waterproofing agent is incorporated in the ink-absorbing layer, and an ink dye-fixing agent is locally provided on and/or in the surface of the ink-absorbing layer.

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CLAIMS

[Claim(s)]

[Claim 1] The sheet for ink-jet record characterized by having made the ink absorption layer contain a deck-watertight-luminaire-ized agent, and carrying out the localization of the fixing agent of an ink color into the front face of this ink absorption layer, and/or a cortex in the sheet for ink-jet record which prepared the ink absorption layer which consists of a binder and a filler on the base material.

[Claim 2] The sheet for ink-jet record according to claim 1 whose deck-watertight-luminaire-ized agent which an ink absorption layer is made to contain is an alumina sol.

[Claim 3] The sheet for ink-jet record according to claim 1 or 2 with which the fixing agent of an ink color consists of the cation nature matter.

[Claim 4] The sheet for ink-jet record according to claim 1 or 2 with which the fixing agent of an ink color consists of the anionic matter.

[Claim 5] The manufacture technique of the sheet for ink-jet record characterized by applying the coating liquid containing the fixing agent of an ink color to the front face of this ink absorption layer, and drying after preparing the ink absorption layer which consists of a binder, a filler, and a deck-watertight-luminaire-ized agent on a base material.

[Claim 6] The manufacture technique according to claim 5 that a deck-watertight-luminaire-ized agent is an alumina sol.

[Claim 7] The manufacture technique according to claim 5 or 6 that the fixing agent of an ink color consists of the cation nature matter.

[Claim 8] The manufacture technique according to claim 5 or 6 that the fixing agent of an ink color consists of the anionic matter.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention injects fine globule liquid, such as water color ink, from a nozzle, and even if it gets wet in the sheet for record of the ink jet printer which carries out the print of a monochrome picture image or the full color picture image at high speed, especially water, it relates to the sheet for record without a color blot.

[0002]

[Description of the Prior Art] In the ink absorption layer of the sheet for record of the ink-jet method recorded by injecting as a globule the distributed liquid of a color or a pigment which is mainly concerned with water It is asked for the function of **, such as the absorptivity of ink, a moderate breadth of ink, and vividness of coloring. In spite of being able to search for the compatibility with the water which is especially a dispersion medium, while it can ask for durability on use and it can ask for the breadth of moderate ink further at the time of a print, after a print can ask also for the function which carries out phase conflict in which it does not spread even if it gets wet in water.

[0003] Since it corresponded to the above-mentioned demand, when an ink absorption layer was conventionally prepared by the coating, to use together and carry out the coating of a deck-watertight-luminaire-ized agent and the color fixing agent was tried. Although the effect that an absorption layer does not separate even if the aforementioned deck-watertight-luminaire-ized agent soaks in water for the purpose of mainly raising the durability of an ink absorption layer and it grinds against a finger strongly is expected, and the effect that a color does not spread is expected even if a color fixing agent mainly dips a print object in water The deck-watertight-luminaire-ized agent and the color fixing agent had the bad miscibility, and when the color fixing agent which the medicine which can be used has a constraint and is sufficient for preventing a blot was used, they had the trouble where absorption of ink and the breadth of the dot at the time of a print were inadequate.

[0004]

[Problem(s) to be Solved by the Invention] Let it be the technical problem that this invention offers the sheet for record which does not have a color blot even if it gets wet in water after a print in the sheet for ink-jet record in view of the above conventional techniques, and its manufacture technique.

[0005]

[Means for Solving the Problem] this invention is what was made for the purpose of solving the above-mentioned technical problem. the configuration of the sheet In the sheet for ink-jet record which prepared the ink absorption layer on the base material It is what is characterized by having infiltrated the deck-watertight-luminaire-ized agent into the ink absorption layer, and carrying out the localization of the fixing agent of an ink color into the front face of an ink absorption layer, and/or a cortex. moreover, the configuration of the manufacture technique After preparing the ink absorption layer which mainly consists of a binder and a deck-watertight-luminaire-ized agent on a base material, it is characterized by applying the coating liquid containing the fixing agent of an ink color to the front face of this ink absorption layer, and drying.

[0006] That is, in order to attain the above-mentioned purpose, as a result of repeating a research, the artificer of this invention was made to inner-***** a deck-watertight-luminaire-ized agent in an ink absorption layer, did learning of what is necessary being just to apply a color fixing agent to the front face, and completed this invention.

[0007] It **, and when the water color ink containing direct dye and acid dye performs ink-jet record, by applying to the front face of an ink absorption layer, using cation nature matter, such as a cation nature polymer, as a color fixing agent, anionic machines, such as a sulfonic group and a carboxyl group, and the color lake of water-insoluble nature are formed into a color, and an ink-jet record picture image is deck-watertight-luminaire-ized.

[0008] Moreover, when water color ink contains basic dye, by applying anionic matter, such as a phosphorus tungsten molybdc acid and tannin, to the front face of an ink absorption layer, cation nature machines, such as an amino group in a color, and the color lake of water-insoluble nature are formed, and a record picture image is deck-watertight-luminaire-ized.

[0009] In order to attain the above-mentioned purpose, it is necessary to apply a color fixing agent to the front face of the ink absorption layer deck-watertight-luminaire-ized by the above. If this color fixing agent is inner-**ed in an ink absorption layer, the deck-watertight-luminaire-ized effect of a deck-watertight-luminaire-ized agent cannot become thin and it cannot attain the purpose. The above-mentioned matter can be made to exist in the front face and/or cortex of the aforementioned absorption layer so much by applying to the front face of an ink absorption layer. In addition, if a lot of color fixing agents are made to contain in the aforementioned ink absorption layer, the aforementioned matter will be made to exist in the whole absorption layer uniformly, and ink absorptive power will deteriorate remarkably.

[0010] Next, this invention is explained in detail. The base material used in this invention is not limited especially if generally used as a sheet for ink-jet record, and films and common papers, such as polyethylene terephthalate, a diacetate, a triacetate, polypropylene, polystyrene, polyethylene, a polycarbonate, a polyvinyl chloride, a polyimide, a polymethacrylate, and a poly-ape phone, etc. are mentioned.

[0011] An ink absorption layer can consist of the color fixing agent mainly applied to a binder, a deck-watertight-luminaire-ized agent, and its front face, in addition can make a filler contain.

[0012] as a binder, PVA (polyvinyl alcohol), polyvinyl butyral, gelatin, polyvinyl acetal, carboxymethyl-cellulose, a polyvinyl pyrrolidone, a styrene-acrylic copolymer, an ethylene-vinyl acetate copolymer, a styrene butadiene rubber, etc. are mentioned, and these are independent -- or it can mix and use

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[0013] As a deck-watertight-luminaire-ized agent which an ink absorption layer is made to contain, although cation nature sols, such as a water-soluble metal salt of the metal more than divalence, such as an aluminum sulfate, chlorination cull ***** , an aluminium acetate, barium chloride, a zinc chloride, a calcium chloride, and magnesium sulfate, and an alumina sol, etc. are used suitably, especially, an alumina sol is congenial to PVA and its effect is also remarkable. in addition, addition — if it carries out comparatively — a binder solid content — it is preferably [50 - 150% of] good 20 to 200%

[0014] the filler which an ink absorption layer can be made to contain is the thing of the water-insoluble nature generally used for the coated paper, for example, a silica, a calcium carbonate, a magnesium carbonate, diatomaceous earth, talc, titanium oxide, etc. are mentioned, and these are independent — or it can be mixed and used

[0015] Mainly, the ink absorption layer which consists of a binder and a deck-watertight-luminaire-ized agent can apply the coating liquid which melted or distributed the binder, the deck-watertight-luminaire-ized agent, and the filler to mediums, such as water and an organic solvent, by the well-known coating technique which used a roll coater, *****-** -, the *****-coating machine, etc. on the base material, and can prepare it by removing a medium.

[0016] As a fixing agent of an ink color, the cation nature matter or the anionic matter is used, and cation nature polymers, such as a polyethyleneimine and polyethyleneimine-epichlorohydrin reactant, a polyethyleneimine-acrylamide addition product, a polyethyleneimine-acrylonitrile addition product, a polyamide-polyamine resin, a polyamide-epichlorohydrin resin, and a polyamide polyamine epichlorohydrin resin, are suitably used as cation nature matter.

[0017] Moreover, as anionic matter, although anionic polymers, such as water-insoluble nature metal salts, such as a tungstophosphoric acid and a molybdophosphoric acid, an ammonium salt of a styrene-maleic-anhydride copolymerization object, and an ammonium salt of an alpha olefin-maleic-anhydride copolymerization object, are used, an anionic polymer is used suitably especially.

[0018] the above-mentioned cation nature and anionic — a solid content any matter one to 30% to solvents, such as a methanol, ethanol, and water Make it melt or distribute so that it may become concentration five to 25% preferably, and it applies to the front face of an ink absorption layer by the coating technique that a roll coater, *****-** -, a *****-coating machine, etc. are conventionally well-known. Then, it is [that what is necessary is just to dry with a dryer] enough if 5-30g / of the amounts of 10-25g/m2wet is preferably applied for the solution of the above-mentioned concentration 2 wet m as a coverage.

[0019]

[Effect of the Invention] this invention can offer the sheet for ink-jet record which a picture image spreads, does not disappear and does not spoil an ink absorptivity and coloring nature, either, even if it is underwater immersed for a long time after performing ink-jet record on it since it is as above-mentioned.

[0020] Moreover, the sheet for this invention ink-jet record can be used also for the sheets for a note, such as an aquosity felt-tipped marker which uses an aquosity color, a ball-point, and a fountain pen.

[0021]

[Example]

Example 1 6% aqueous solution of PVA (PVAR-1130 Kuraray Co., Ltd. make) 64 weight section Silica (Ms. ***** P-78F Mizusawa chemistry company make) 10 ** alumina sol (alumina-sol 200 Nissan chemistry company make, 30% of solid contents) What distributed 10 ** well was made into the coating liquid of an ink absorption layer. It applied and this thing was dried so that a xeransis thickness might become a polyester film with a thickness of 100 micrometers with 40 micrometers, and the ink absorption layer was formed.

[0022] Next, what melted the polyamide epichlorohydrin resin 20 section in the methanol of the 80 sections was made into coating liquid, the amount of 20g/m2wet was applied to the front face of the above-mentioned ink absorption layer by the *****-coating machine, it dried and the sheet for record of an example of this invention was obtained.

[0023] When ink-jet record was given by the water color ink which used acid dye and direct dye for this thing, respectively, the clear high record picture image of coloring concentration was acquired. Furthermore, a picture image oozes, this thing is carried out, when underwater immersed for one year, there is also no ***** , and the clearness immediately after a print was maintained.

[0024] Example 2 6% aqueous solution of PVA (PVAR-1130 Kuraray Co., Ltd. make) 64 Weight section Silica (Ms. ***** P-78F Mizusawa chemistry company make) 8 ** alumina sol (alumina-sol 200 Nissan chemistry company make, 30% of solid contents) What distributed well 15 ** was made into the coating liquid of an ink absorption layer. This thing was applied so that a xeransis thickness might become a polypropylene film with a thickness of 50 micrometers with 45 micrometers, and it dried, and the ink absorption layer was formed.

[0025] Next, what melted the polyamide-polyamine resin 28 section in the methanol of the 72 sections was made into coating liquid, the amount of 10g/m2wet was applied to the front face of the above-mentioned ink absorption layer by the roll coater, it dried and the sheet for record of example of another of this invention was obtained.

[0026] When this thing was tested like the example 1, the completely same result as an example 1 was obtained.

[0027] Example The coating liquid which melted the styrene-maleic-anhydride copolymerization object ammonium salt of the five sections in the water of the 95 sections was applied to the front face of the ink absorption layer of three examples 1 so that it might be set to 30g/m2wet, and it dried, and the sheet for record of example of another of this invention was obtained.

[0028] When ink-jet record was given by the water color ink which used basic dye for this thing, the clear high record picture image of coloring concentration was acquired. Furthermore, when this thing was underwater immersed for one year, the same result as an example 1 was obtained.

[0029] Example The coating liquid which melted the zinc acetate hydrate of the 25 sections in the water of the 75 sections was applied to the front face of the ink absorption layer of four examples 2 so that it might be set to 15g/m2wet, and it dried, and the sheet for record of example of another of this invention was obtained.

[0030] Like the example 1, when ink-jet record was given by the water color ink [thing / this] using acid dye and direct dye, respectively, the clear high record picture image of coloring concentration was acquired. Furthermore, a picture image oozes, this thing is carried out, when underwater immersed for one year, there is also no ***** , and the clearness immediately after a print was maintained.

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